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Porcine-derived gelatin foam is a versatile clotting agent that surgeons can use to prevent haemorrhage during and after complex surgical procedures of all kinds.

David Engels, Pharmacia Corporation

Topical haemostatic agents help surgeons control bleeding when meticulous surgical technique and the proper use of ligatures and conventional procedures fail. They hasten clot formation and give clots structural support, thus providing additional haemorrhage control to the body's own protective mechanism. This minimises blood loss, decreases the time taken to complete the procedure and increases the field of vision during surgery.

Agent development

Before 1945, surgeons used a synthetic haemostatic agent called fibrin foam. It was derived from blood plasma donated by the public. After World War Two, the shortage of donations meant that a manufactured substance with properties similar to fibrin foam, but not requiring human blood as a source, was needed. In response, research scientists at Pharmacia developed a haemostatic agent made from specially treated porcine-derived gelatin called Gelfoam.

Gelfoam proved to be as good as, and even superior to fibrin foam in many respects, particularly in its ease of handling and tensile strength. It is sterile, white, tough, non-friable, porous and can be applied dry or saturated with saline solution.

As well as coming in many sizes and forms, Gelfoam is easy to handle and can be cut into shapes that fill cavities and support tissue. It is pliable when wet and moulds to the contours of the surface on which it is pressed.

Helping natural healing

Implanted Gelfoam can be left in the tissue and is readily absorbed without inducing excessive inflammatory reaction or irritation. In contrast, non-absorbable haemostatic agents can start the bleeding again when removed. Gelfoam prevents thrombin from spreading into the opened vessels and causing thrombosis.

When held in contact with the bleeding surface, the Gelfoam sponge draws blood into its many interstices. The blood then sticks to the underlying tissue via strands of fibrin and becomes an integral part of the clot. Gelfoam actually aids the healing process by providing a latticework for fibroblastic repair, adding rigidity to the wound and being gradually replaced by normal tissue. Gelfoam usually takes 3-5 weeks to be fully absorbed, but in mucosal surfaces it only takes 2-5 days.

Gelfoam sponge is an excellent haemostatic agent even without thrombin. The

Gelfoam sponge is an excellent haemostatic agent even without thrombin. The clot forms directly within the sponge, which then acts as a patch. Once the blood saturates the sponge, the clot forms at the same rate as when the sponge is soaked in thrombin. This haemostatic action results from the disintegration of blood platelets and the consequent release of thromboplastin, which stimulates thrombin formation in the interstices of the sponge.

Multiple applications

Neurosurgeons' needs have led to the development of a pliable gelatin film called Gelfilm. This replaces injured dura and prevents adhesions between the pia arachnoid/brain and overlying structures. Gelfilm is transparent and easy to cut. Moreover, it remains in situ for approximately 90 days, gradually replaced thereafter by a sheath of connective tissue, which Gelfilm guides across the defect. Like Gelfoam, Gelfilm is used in many other applications other than the one for which it was originally devised.

As there is scarcely a surgical field in which Gelfoam and Gelfilm have not proven beneficial, it is not possible to list all their clinical applications. It is also used in the conservative treatment of chronic leg ulcers and as an aid to obtaining biopsy tissue. Gelfoam is beneficial both in the surgical specialties and general surgery.

Pharmacia & Upjohn
Mail Stop 4 - 4202, 100 Route 206
North Peapack, NJ 07977
USA
Tel: +1 908 901 8000
Fax: +1 908 901 1878
Email: David.J.Engels@am.pnu.com

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